



# TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477

Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

December 14, 1998

Ms. Nancy Huelsberg  
Green Mountain Power Corporation  
P.O. Box 850  
South Burlington, VT 05402-0850

**RE: Site Investigation Report  
Green Mountain Power Corporation  
Chace Mill Substation #29 - Mill Street - Burlington, Vermont  
TSEC Project #98-078, VT SMS Site #97-2325**

DEC 17 10 45 AM '98  
WASTE MANAGEMENT  
DIVISION

Dear Ms. Huelsberg:

Enclosed is the Site Investigation Report, which was prepared by Twin State Environmental Corporation (TSEC) to evaluate the subsurface environmental conditions of the Chace Mill Substation #29 SITE located in Burlington, VT. This investigation was performed following receipt of a June 26, 1998 letter from Mr. Chuck Schwer of the State of Vermont Department of Environmental Conservation to Green Mountain Power Corporation (GMP).

During this SITE investigation, thirteen (13) soil borings were advanced to characterize the shallow subsurface soils at the SITE. Borings were completed using Geoprobe® sampling tools. All soil samples were collected and field screened for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID). Five (5) soil samples were submitted for laboratory analyses. Total petroleum hydrocarbons (TPH) were analyzed via US EPA Method 8100M and polychlorinated biphenyls (PCB's) were analyzed via US EPA Method 8080.

During the installation of soil brings, refusal was encountered between 1.0 and 8.0 ft below ground surface (bgs). Significant overburden groundwater was not encountered during this investigation. One (1) temporary groundwater monitoring well, however, was installed within the substation boundaries.

Data returned from laboratory analyses, along with field observations, indicate that low levels of petroleum-related contamination have impacted the soils beneath the SITE, primarily in the immediate vicinity of the former transformers that were replaced in May 1994. No PCB compounds, however, were detected in any of the laboratory samples submitted.

A receptor evaluation conducted during this investigation did not identify any sensitive receptors that are likely to be impacted from current conditions found on SITE.

Ms. Nancy Huelsberg  
Green Mountain Power Corp.  
December 14, 1889

We have recommended that the site be considered for Sites Management Activity Complete (SMAC) designation.

If you have any questions regarding the results of this investigation, please feel free to contact us.

Sincerely,  
**TWIN STATE ENVIRONMENTAL CORPORATION**

A handwritten signature in black ink, appearing to read "Jon Berntsen", written over a horizontal line.

Jon Berntsen  
Project Manager

cc: Mr. Robert G. Butler, VT SMS



## State of Vermont

Department of Fish and Wildlife  
Department of Forests, Parks and Recreation  
Department of Environmental Conservation  
State Geologist  
RELAY SERVICE FOR THE HEARING IMPAIRED  
1-800-253-0191 TDD>Voice  
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES  
Department of Environmental Conservation  
Waste Management Division  
103 South Main Street/West Office  
Waterbury, Vermont 05671-0404  
(802) 241-3888  
FAX (802) 241-3296

June 26, 1998

Ms. Nancy A. Huelsberg  
Green Mountain Power Company  
P.O. Box 850  
South Burlington, Vermont 05402-0850

RE: Request for Additional Investigation  
Chase Mill Substation (#29), Burlington, Vermont  
SMS Site 97-2325

Dear Ms. Huelsberg:

Pursuant to our site meeting of June 9, 1998 SMS is requesting further investigation at the above referenced site. During our meeting we discussed the need for additional groundwater quality information downgradient of the release. Also discussed was the fact that the transformer at the site contained Mineral Oil Dielectric Fluid (MODF) with polychlorinated biphenyls (PCB) in concentrations of 5 and 9 ppm.

The following site investigation history is reconstructed from lab reports and diagrams submitted by GMPC in a letter dated November 10, 1997.

The release was discovered November 1993 (based on lab report dates) and was reported to the Sites Management Section (SMS) in a letter dated November 10, 1997. A portion of the consultants report (lab data, tables, and figures) was provided to SMS with text generated by your office. The data provided indicate soils within the fenced transformer area (sample id E-893-1 through 13) are contaminated with total BTEX ranging from non-detect to 666 parts per billion (ppb) and TPH ranging from 21 to 4,180 parts per million (ppm). All 13 soil samples contained detectable concentrations of TPH and/or BTEX compounds. No analyses were for PCB's were conducted on these samples.

Soils borings and monitoring wells were installed at or proximal to the perimeter of the fenced transformer yard. Boring B-1 appears to have been installed in December 1993 or January 1994. A soil sample was submitted for laboratory analysis of TPH and BTEX. The Chain of Custody for this sample has conflicting sample dates of what appears to be December 22, 1993 overwritten with the date January 17, 1994. The sample contained 169 ppm TPH.

On April 6 and 7, 1994 soils samples were obtained during the installation of monitoring wells MW-2 and MW-3. On April 8, 1998 soil samples were obtained from borings B-1, B-2, and B-3. These five soil samples did not contain detectable concentrations of PCB or TPH. Based on the lab sheets no samples were submitted for MW-1 yet the summary table indicates no BTEX compounds were detected for this location. SMS assumes that this B-1 boring is separate and distinct from the B-1 boring of December 1993. Is the first boring identified as B-1 actually the boring for monitoring well MW-1? The summary table indicates that no TPH was detected yet the B-1 sample with a 1993/1994 lab date contained 169 ppm.

On April 10, 1994 ground water samples were obtained from MW-1 through MW-3 and analyzed for BTEX and TPH. With the exception of 2.0 ppb xylene in MW-2, no other BTEX or TPH compounds were detected.

On May 17, 1994 five additional soil samples were collected and submitted for laboratory analysis BTEX. These samples, labeled B1A, B2A, B3A, MW-2A and MW-3A, contained no detectable concentrations of BTEX.

Based on a contour map provided by groundwater flows northwest at a gradient of approximately 6-7 percent. This would indicate that MW-1 and MW-2 were installed in an upgradient location to the release area and MW-3 was installed oblique to the release area. Bedrock outcrop is located approximately 30 feet south of the substation and all along the river which is less than 100 feet north of the substation.

Based on this information and our site meeting SMS requests the following:

- ☐ Install at least one additional monitoring well downgradient of the release area. A soil sample from the well should be analyzed for TPH and BTEX. If TPH is detected, then the soil should be analyzed for PCB. Groundwater sample from that well should be analyzed for TPH and BTEX.
- ☐ If GMPC elects to leave the contaminated soils in-situ then the soils should be analyzed for PCB. If PCB's are detected, then a risk assessment should be conducted including recommendations for mitigation or controls of the soil.
- ☐ Conduct a sensitive receptor survey in accordance with *Site Investigation Guidance* dated August 1996;
- ☐ Provide an explanation as to why GMPC waited four years to report this release;
- ☐ Provide a history of the Clean Harbors Investigation that will lend some clarity to the sample history (eg: multiple B-1 borings, inconsistencies between CHES tables and lab sheets, and inconsistencies with Chain-of-Custody date for the B-1 sample (12/93 or 1/94).
- ☐ Provide all appropriate data on the PCB concentrations in the MODF from the site transformers;
- ☐ Submit these data and previous data in a report that is consistent with the requirements of *Site Investigation Guidance* dated August 1996. Specifically, SMS requests that this include the information stipulated in the section Site Investigation Report on pages 3 through 5 of the document.

Please have your consultant submit a preliminary work plan and cost estimate or a site investigation expressway notification form within fifteen days of your receipt of this letter, so it may be approved prior to the initiation of onsite work. Enclosed please find a list of consultants who perform this type of work as well as the brochure "*Selecting Your UST Cleanup Contractor*," which will help you in choosing an environmental consultant.

If you have any questions, please feel free to call me at (802) 241-3876.

Sincerely,

Bob Buzer

Chuck Schwer, Supervisor  
Sites Management Section

2.9 ppm PCB =



# TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477

Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

Phase (check one)	Type (check one)
<input checked="" type="checkbox"/> <b>Site Investigation</b>	<input type="checkbox"/> Work Scope
<input type="checkbox"/> Corrective Action Feasibility Investigation	<input checked="" type="checkbox"/> <b>Technical Report</b>
<input type="checkbox"/> Corrective Action Plan	<input type="checkbox"/> PCF Reimbursement Request
<input type="checkbox"/> Corrective Action Summary Report	<input type="checkbox"/> General Correspondence
<input type="checkbox"/> Operations & Monitoring Report	

## SITE INVESTIGATION REPORT GREEN MOUNTAIN POWER CORP. CHACE MILL SUBSTATION #29

December 14, 1998

Mill Street  
Burlington, Vermont

TSEC Project # 98-078  
SMS Site #97-2325

Report Prepared for:  
Green Mountain Power Corporation  
P.O. Box 850  
South Burlington, VT 05401-0850  
Contact: Ms. Nancy Huelsberg  
(802) 660-5674

Written By:

Jon Berntsen  
Project Manager

Reviewed By:

John R. Diego  
Vice President

Dec 17 10 45 AM '98  
TWIN STATE ENVIRONMENTAL CORP.  
GREEN MOUNTAIN POWER CORP.

## 1.0 INTRODUCTION

This report has been prepared by Twin State Environmental Corporation (TSEC) under an agreement with Green Mountain Power Corporation (GMP) to present the findings of our recent subsurface investigation at the Chace Mill Substation #29 (SITE). The SITE is located proximate to the Chace Mill Office Complex on Mill Street in Burlington, Vermont (See SITE Location Map, **Figure 1**, and SITE Plan, **Figure 2**).

Environmental investigation activities were initiated following the receipt of a June 26, 1998 letter from Mr. Chuck Schwer (presented as **Attachment 1**) of the State of Vermont Agency of Natural Resources, Sites Management Section (SMS) to GMP. Within this letter, GMP was requested to further define the degree and extent of soil and groundwater contamination following the release of mineral oil from the former transformer removed from the SITE in May 1994. This investigation was intended to satisfy the requirements of a Site Investigation as required under 10 V.S.A. § 6615 of the State of Vermont Waste Management Statutes.

## 2.0 BACKGROUND

The Chace Mill Substation #29 has been present at this location since at least the late 1940's (according to historical USGS Topographic Maps, circa 1948). Recent upgrades at the facility include the May 1994 removal of three (3) vintage 1920's electrical transformers. The three (3) transformers were replaced with one (1) large transformer with secondary containment.

The entire facility covers approximately  $4,800 \text{ ft}^2 \pm$  and consists of a large transformer and associated control equipment, and a single story wood framed building. The ground surface is predominantly imported gravel. High voltage lines pass overhead from north to south. The entire area is surrounded by an  $8 \text{ ft} \pm$  high chain-link fence. The entry gate remains locked at all times.

## 3.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Two (2) environmental investigations were conducted at the SITE by Clean Harbors Environmental Services (CHES) of Glenmont (Albany), New York in an attempt to define the degree and extent of subsurface contamination. The findings of these investigations were presented to GMP in letter reports dated October 23, 1993 and June 29, 1994. The following sections describe the CHES studies in further detail.

### 3.1 CHES – October 1993 Letter Report

This letter report was written to detail the findings of a soil boring program conducted between September 22 and 23, 1993 by CHES. This investigation consisted of the completion of thirteen (13) soil borings using both a power auger and a hand auger. The power auger was used to open the boring to the desired sample depth, and the hand auger was used to collect the sample.

Soil samples were field screened for volatile organic compounds (VOCs) using a photoionization detector, and submitted for laboratory analysis via US EPA Method 8020 for VOCs, and via US EPA Method 418.1 for total petroleum hydrocarbons (TPH). Results of these analyses indicated that petroleum hydrocarbons were detected in all samples collected. One sample, collected adjacent to the former transformer pad, exhibited a TPH concentration of 4,180 milligrams per kilogram (mg/kg). Based on the information obtained during this investigation, CHES recommended additional work be performed in the form of a site investigation.

### 3.2 CHES – June 1994 Summary Report

Supplemental site investigation activities were performed by CHES in December 1993 and April 1994. Activities conducted during this time included the completion of three (3) test borings and three (3) groundwater monitoring wells, and the completion of one (1) round of groundwater sampling activities.

Soil borings were advanced using either a hand auger, or using a truck mounted hollow stem auger drill rig. Refusal on bedrock was encountered at shallow depths during boring activities. Due to the shallow depths to bedrock (2.5 to 5.0 ft below ground surface [bgs]), and the lack of significant groundwater, CHES elected to employ air rotary drilling techniques to install three (3) groundwater monitoring wells in the bedrock formation. Wells were completed to depths ranging from 20 to 24 ft bgs.

Soil samples were collected during the installation of the soil borings and monitoring wells. Collected samples were field screened with a PID for VOCs, and submitted for laboratory analysis via US EPA Method 418.1 for TPH, via US EPA Method 8020 for VOCs, and via US EPA Method 8080 for PCBs. Laboratory analyses indicated that TPH was detected in one sample (MW-1, 169 mg/kg). PCBs and VOCs were not detected above method detection limits (MDLs) in any of the analyzed samples.

Prior to the collection of groundwater samples, water table elevation measurements were collected, and a groundwater flow direction was established. Groundwater flow was calculated to flow to the northwest, towards the Winooski River.

Groundwater samples were collected from the newly installed groundwater monitoring wells and submitted for laboratory analysis of VOCs via US EPA Method 8020, and for TPH via US EPA Method 418.1. The only compound detected above the MDL was total xylenes, present at 2 micrograms per liter ( $\mu\text{g/l}$ ) in MW-2.

From the CHES reports, it can be determined that significant contamination has not migrated from within the fenced substation to the soil and groundwater immediately surrounding the SITE.

### 4.0 SCOPE OF SERVICES

The following scope of services was performed by TSEC during this investigation, as outlined in our September 10, 1998 work scope and cost estimate and amended as appropriate. Authorization to

proceed was granted by Mr. Robert G. Butler of the VT Sites Management Section (SMS) on October 2, 1998:

- A SITE specific Health and Safety Plan (HASP) was prepared in accordance with OSHA guidelines (29 CFR 1910.120). A copy of this HASP has been presented as **Attachment 2**.
- DIG SAFE was contacted and requested to provide an underground utility markout (Clearance #984 008 980) as required by law.
- Thirteen (13) Geoprobe® borings were advanced at the SITE to investigate soil contamination resulting from the former transformers. Recovered soil samples were screened for VOCs using a Thermo Environmental Instruments Organic Vapor Meter (OVM) equipped with a 10.6 eV PID lamp. Conventional headspace methods were utilized to measure the volatile components liberated from the soil.
- One (1) 1-inch diameter groundwater monitoring well was installed during soil boring activities. This well was installed into boring B-1, and was completed to a depth of approximately 8 ft bgs.
- Soil samples were collected from five (5) soil borings and submitted for laboratory analysis. Soils were analyzed via US EPA Method 8080 for PCBs, and via US EPA method 8100M for total petroleum hydrocarbons (TPH) as transformer oil.
- A complete SITE survey was conducted that included the location of pertinent SITE features and environmental sampling locations.
- This summary report was prepared, discussing SITE history, investigation methods, procedures, and findings. Professional recommendations are also included that address the contamination discovered at the SITE.

## 5.0 SITE LOCATION AND DESCRIPTION

**SITE Owner:** Green Mountain Power Corporation  
**SITE** Mill Street  
**Address:** Burlington, Vermont  
**Lat./Long.:** 44°31'34.42" North 72°57'4.54" West  
**SITE Size:** 4,800 ft<sup>2</sup> ± (0.11± acres)  
**Zoning:** Residential/Commercial  
**Utilities:** Water and Sewer- None  
Electric- Overhead high-voltage lines enter from north and exit to south.  
**Structures:** One (1) single story wooden framed building covering approximately 580 ft<sup>2</sup> located in the northwest portion of the fenced area. One (1) large transformer and associated secondary containment structure is located in the northeast corner of the fenced area.



The SITE is located on Mill Street, approximately 1,000 ft east of the intersection of Mill Street, Riverside Avenue, and Colchester Avenue in Burlington, Chittenden County, Vermont (see SITE Location Map, Figure 1). The SITE is currently occupied by an electrical transformer station.

The SITE is commercially zoned and is situated in a mixed residential and commercial land use area. Properties adjacent to the SITE consist of the Chace Mill Office Complex immediately to the west, an unoccupied wooded area to the east, the Winooski River to the north, and a residential neighborhood to the south.

The topography of the southern portion of the defined SITE is relatively flat. The northern portion of the SITE steeply slopes to the north to the Winooski River. The nearest surface water and sensitive receptor is the Winooski River, located less than 50 ft to the north and at an elevation 25 ft± below the SITE.

## **6.0 SITE INVESTIGATION ACTIVITIES**

The subsurface exploration program described below was developed by TSEC in order to gather data to provide a better understanding of the hydrogeology and contaminant distribution related to the SITE.

### **6.1 Advancement of Soil Borings**

TSEC completed thirteen (13) soil borings on SITE on October 6, 1998 using Geoprobe® direct push technology and/or Geoprobe® tools advanced with hand tools. The borings were installed in the following locations and are depicted on the SITE Plan, Figure 2.

- Soil Boring B-1 was advanced approximately 4 ft to the northeast of the transformer pad that contained the three (3) former transformers. This boring was completed to assess the subsurface conditions adjacent to the suspected source area. Refusal was encountered at a depth of 8.0 ft bgs.
- Soil Boring B-2 was advanced directly adjacent to the north end of the existing transformer and containment area. This boring was advanced to assess the subsurface conditions downgradient of the suspected source area. Refusal was encountered at a depth of 6.0 ft bgs.
- Soil Boring B-3 was advanced directly adjacent to the northeast end of the existing transformer and containment structure. This boring was also advanced to assess the subsurface conditions downgradient of the suspected source area. Refusal was encountered at 5.5 ft bgs.
- Soil Boring B-4 was advanced directly adjacent to the north end of the SITE building, in an attempt to determine if contamination was present downgradient of the structure. This boring encountered refusal at a depth of 4.5 ft bgs.

- Soil Boring B-5 was advanced approximately 10 ft north of the northwest corner of the SITE building to determine if contamination existed in the northwest corner of the fenced area. Refusal was encountered at 4.0 ft bgs.
- Soil Boring B-6 was advanced immediately to the west of a control panel. This boring was completed to refusal at a total depth of 1.0 ft bgs.
- Soil Boring B-6B was advanced approximately 10 ft to the south of boring B-6. This boring was completed to a total depth of 2.0 ft bgs.
- Soil Boring B-7 was advanced between two sets of control panels in the approximate center of the SITE. This boring was completed to refusal at a total depth of 3.0 ft bgs.
- Soil Boring B-8 was advanced approximately 10 ft to the south of the former transformer pad. This boring was completed to refusal at a total depth of 3.0 ft bgs.
- Soil Boring B-9 was advanced directly to the east of monitoring well MW-1, installed by CHES in 1994. This boring was completed to refusal at a total depth of 2.0 ft bgs.
- Soil Boring B-10 was advanced adjacent to the southwest corner of the fenced area to determine the potential for the off SITE migration of contamination. This boring was completed to refusal at a total depth of 6.0 ft bgs.
- Soil Boring B-11 was advanced adjacent to the northwest corner of the fenced area to determine the potential for the off SITE migration of contamination in the downgradient direction. This boring was completed to refusal at a total depth of 2.0 ft bgs.
- Soil Boring B-12 was advanced approximately 2 ft to the north of the facility perimeter fence. This boring was completed to determine the downgradient extent of petroleum contamination outside of the fenced perimeter. Refusal was encountered at a total depth of 2.5 ft bgs.

Further details of the soil borings and monitor well are presented below and in **Appendix A: Boring Logs**.

Borings were advanced to depths ranging from 1.0 to 8.0 ft bgs. All borings were logged, describing soil strata conditions, and analyzed with the PID using conventional jar headspace techniques.

VOC contaminated soil was not encountered during the installation of any soil borings, as evidenced by the lack of positive PID headspace readings ( $>0.1$  parts per million vapor [ppmv]). Please refer to **Appendix A, Boring Logs** for a summary of PID readings obtained during this investigation.

## 6.2 SITE Geology

General soil conditions encountered at the SITE consisted of a coarse gravel surface layer, underlain by medium to coarse sand. Below the sand, a black fill material was encountered that appeared to be similar to a foundry slag material. Silty fine sand was encountered below the black fill material,

followed by bedrock. During the installation of boring B-2, organic material was encountered between 4.5 and 5.0 ft bgs. Significant groundwater was not encountered during this investigation.

Reports published by the Vermont Geological Survey<sup>1,2</sup> indicate that the surficial deposits in the SITE vicinity are comprised of marine and fluvial sands. Bedrock beneath the SITE is reportedly comprised of a Cambrian Age (505-570 million years old) light gray dolomite known as the Winooski Formation. For a more detailed description of geological units, see Boring Logs, **Appendix A**.

## 7.0 SOIL SAMPLING ACTIVITIES

Soil samples were collected from five (5) of the thirteen (13) soil borings and submitted to Endyne, Inc. of Williston, Vermont (Endyne) for laboratory analysis of PCBs and TPH. TPH analyses were conducted via US EPA Method 8100M referenced to a transformer oil standard, provided by GMP. PCB analyses were conducted via US EPA Method 8080.

Soil samples were collected from soil borings B-1 (0-4 ft), B-3 (4-5 ft), B-4 (3-4 ft), B-8 (1-3 ft), and B-12 (0-2 ft). These samples were selected due to visual observations, and the likelihood of contamination due to location of the sample with respect to the suspected source area.

### 7.1 Analytical Results

The laboratory report received from Endyne indicated that PCBs were not present above the MDL of 0.020 milligrams per kilogram (mg/kg) in any of the samples submitted for analysis. Total petroleum hydrocarbons were detected in three (3) samples above the MDL of 5.0 mg/kg. Soil boring B-1 contained TPH at 72.2 mg/kg; B-3 at 11.7 mg/kg; and B-12 at 18.5 mg/kg. A summary of laboratory data is presented in **Table 1**. The complete laboratory package received from Endyne is presented as **Attachment 3**.

Currently, the State of Vermont does not have any published enforcement standards for soil quality. The US Environmental Protection Agency (US EPA) Region 3 Risk Based Concentration (RBC) Table is often referenced to determine an acceptable contaminant concentration. The RBC table, however, does not provide guidance for levels of TPH.

In the past, site managers at the SMS have referenced an acceptable concentration of TPH in soils of 200 mg/kg. TSEC references the New Hampshire Department of Environmental Services (NH DES) Risk Characterization and Management Policy (RCMP) soil standards. The RCMP describes a tiered risk-based approach to characterize risks to human health and environment posed by the release of contaminants at sites. The policy is based on current toxicology and risk assessment information and is periodically updated. The NH DES RCMP cites an allowable concentration of 10,000 mg/kg of TPH in soils, regardless of SITE use (i.e.- residential, commercial, or industrial). The TPH analytical data

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<sup>1</sup> Stewart, David P., 1970, Surficial Geologic Map of Vermont: C.G. Doll, Editor, Vermont Geol. Survey.

<sup>2</sup> Stone, S.W. and Dennis, J.G., 1964, Geology of the Milton Quadrangle, Vermont  
VT Geol. Surv., Bull., no. 26, 79p., SGL, VSL

meets the RCMP concentrations as well as the "200 ppm value" that has been referenced for other sites in Vermont.

## 7.2 Discussion of TPH Analytical Methods

During the initial investigation conducted by CHES in September 1993, TPH concentrations detected in soil samples submitted for laboratory analyses were found to range from 21 mg/kg to 4,180 mg/kg. These analyses were conducted via US EPA Method 418.1.

The maximum concentration detected during this Site Investigation was 72.2 mg/kg. This sample was collected adjacent to the transformer pad and analyzed via US EPA Method 8100M.

US EPA Method 8100M is conducted using a gas chromatograph (GC), while US EPA Method 418.1 is conducted using an Infra-Red spectrophotometer. The data obtained from the Method 8100M analysis is compared to a known chemical standard. In the case of the Chace Mill investigation, a transformer oil standard was used. The data obtained from Method 418.1 represents a total amount of petroleum hydrocarbons present in a given sample regardless of origin (e.g.- gasoline, fuel oil, motor oil, etc.). This includes naturally occurring hydrocarbons, and may lead to false positives if sufficient natural organic matter is present in the sample. The State of Vermont does not recognize Method 418.1 as a valid analytical method for TPH.

## 8.0 RECEPTOR EVALUATION

During the SITE investigation activities, a sensitive receptor evaluation was conducted in the immediate vicinity. This investigation focused on surface water and groundwater receptors, human receptors, and area residences.

A visual reconnaissance was performed along the riverbank adjacent to the north end of the SITE, attempting to identify seeps, or other evidence that petroleum related contamination or groundwater is migrating off SITE. No seeps were located.

The Winooski River, the nearest surface water receptor to the SITE, is located approximately 50 feet to the north of the SITE. Due to the low levels of contamination detected during this investigation, and the lack of significant overburden groundwater present to act as a transport mechanism, it does not appear likely to be impacted from the conditions existing on SITE.

Residences in the vicinity obtain water from the City of Burlington Water Department. Additionally, houses in the vicinity are all upgradient of the SITE, and are not likely to be impacted.

Access to the SITE is restricted at all times to authorized GMP personnel only. There is an 8 ft high perimeter fence surrounding the facility, and the entry gate is locked at all times.

No other sensitive receptors were identified within the immediate vicinity during this investigation.

## 9.0 SUMMARY AND CONCLUSIONS

Based on the information and analytical data obtained during this investigation, TSEC concludes the following:

- The suspected source of the contamination, the three (3) former transformers, have been removed from the SITE. They were replaced with one (1) new transformer with secondary containment in 1994.
- Soils encountered in the vicinity of the former transformer pad exhibited some dark coloration. Laboratory analysis conducted on a sample collected from this location (B-1) indicated low levels of TPH as transformer oil.

No other significant contamination was observed. It appears as though the degree and extent of petroleum contamination within the subsurface soils at the SITE has been adequately defined, and that the contamination is limited to the overburden soils proximate to the former transformer pad.

- Bedrock was encountered prior to a competent overburden aquifer. The groundwater monitoring well installed into soil boring B-1 did not contain enough groundwater to collect a representative sample.
- Based on contaminant levels in soil at the overburden/bedrock interface, and the low mobility of the contaminants due to limited transport mechanisms, it does not appear as though significant petroleum contamination has entered the bedrock formation beneath the SITE. Additionally, no significant contamination appears to have migrated beyond the SITE boundaries.
- The groundwater monitoring wells installed at the SITE in 1994 were not sampled as part of this investigation. The three (3) wells at the SITE are installed into the bedrock formation; samples collected from the wells will not be representative of conditions in the overburden. Historical data indicates that only xylenes were detected in MW-2 at a concentration of 2 µg/l. The wells did not contain detectable concentrations of any other US EPA Method 8020 target VOCs, or TPH via US EPA Method 418.1.

## 10.0 RECOMMENDATIONS

Due to the limited presence of contamination in soil, and the lack of a contaminant transporting mechanism, TSEC recommends the following:

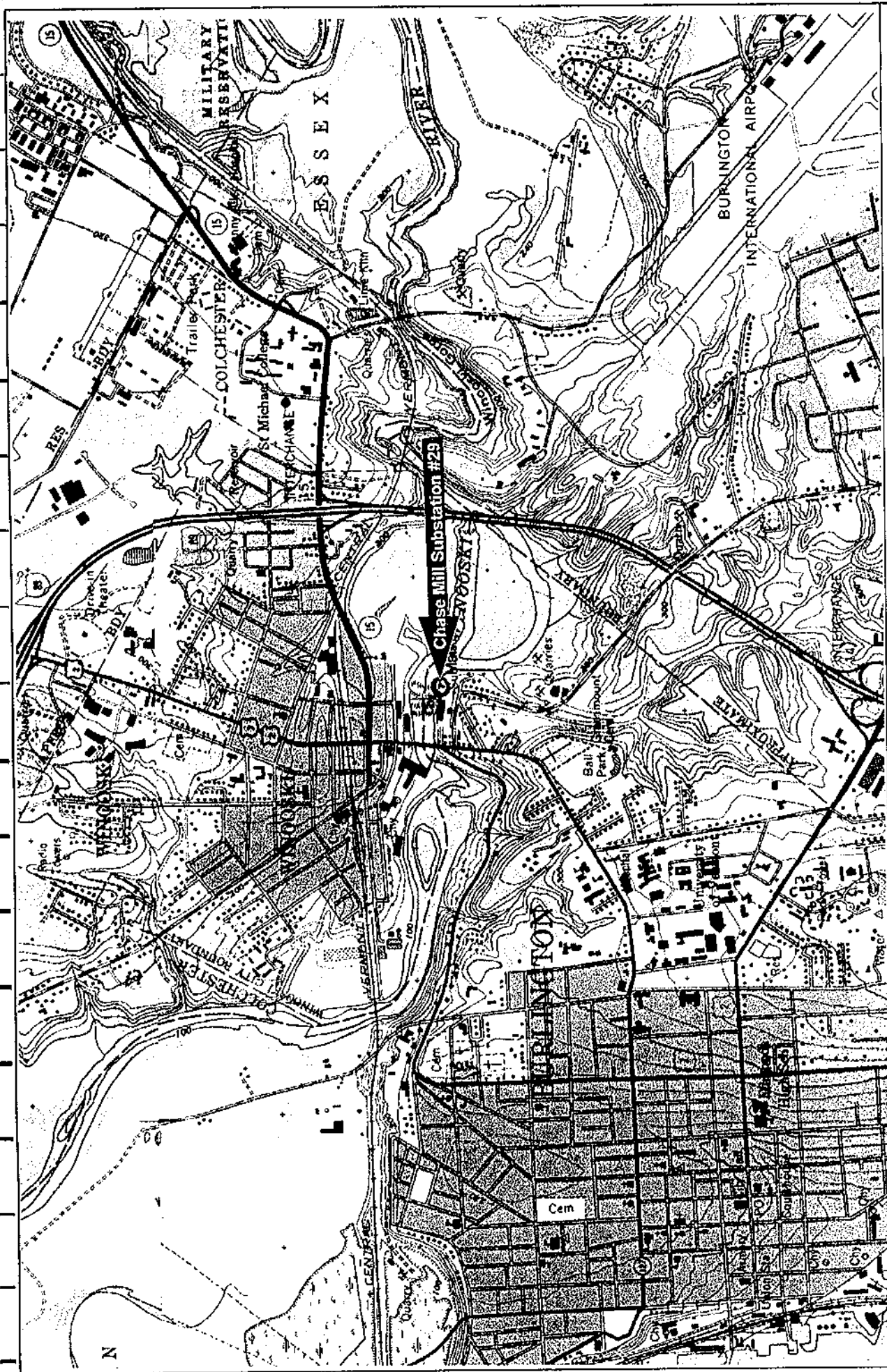
- The SITE appears eligible to be considered for a Site Management Activity Completed (SMAC) designation, according to the "Site Management Activity Completed Classification Procedure" document issued by the VT SMS.

To be considered eligible for a SMAC designation, the SITE must meet the following conditions:

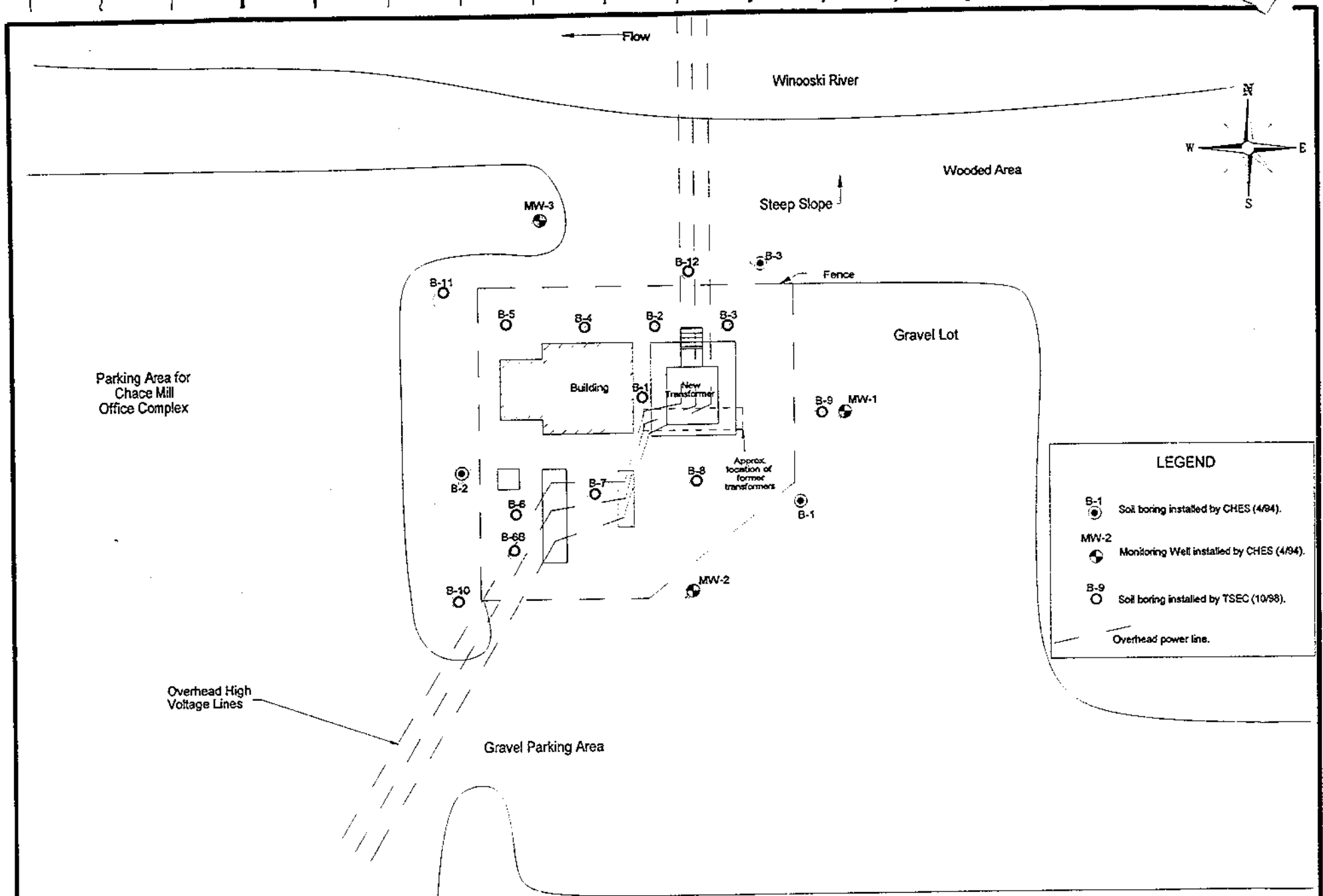
1. The source(s), nature, and the extent of the contamination will have been adequately defined.
2. The source has been removed from the SITE.
3. Levels of contaminants detected in soil and groundwater shall be stable, falling, or non-detect.
4. Vermont Groundwater Enforcement Standards (VGES) shall be met at compliance points established by the VT SMS. Soil contaminant guidelines shall also be met.
5. No unacceptable threat to human health or the environment exists at the SITE from exposure to hazardous materials.
6. SITE meets RCRA requirements.
7. SITE meets CERCLA requirements.

A completed SMAC checklist has been included as **Attachment 4**, which documents that this SITE is eligible for SMAC designation.

## FIGURES







**LEGEND**

- B-1 Soil boring installed by CHES (4/94).
- MW-2 Monitoring Well installed by CHES (4/94).
- B-9 Soil boring installed by TSEC (10/98).
- Overhead power line.

0 5 10 20 30 ft  
**SCALE**  
 1" = 30'

Project No.: 98-078	Designed By: jpb	TWIN STATE ENVIRONMENTAL CORP. 65 Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	<b>FIGURE 2</b> <b>SITE PLAN</b>  Green Mountain Power Corp. Chace Mill Substation #29 Burlington, Vermont
	Checked By:		
	Approved By:		
	Drawn By: jpb		
	Scale: 1" = 30'		
	Date: 09/08/98		

## TABLE

TABLE 1

**GREEN MOUNTAIN POWER CORPORATION  
CHACE MILL SUBSTATION #29  
BURLINGTON, VERMONT**

Summary of Soil Quality

October 6, 1998

Sample ID and Depth	US EPA Region III RBC Guideline	B-1 0-4 ft	B-3 4-5 ft	B-4 3-4 ft	B-8 1-3 ft	B-12 0-2 ft
Target Analyte	Concentration (in mg/kg)					
Polychlorinated Bi-Phenyls (PCB)						
Arochlor-1016	2.9	<0.020	<0.020	<0.020	<0.020	<0.020
Arochlor-1221	82	<0.020	<0.020	<0.020	<0.020	<0.020
Arochlor-1232	2.9	<0.020	<0.020	<0.020	<0.020	<0.020
Arochlor-1242	2.9	<0.020	<0.020	<0.020	<0.020	<0.020
Arochlor-1248	2.9	<0.020	<0.020	<0.020	<0.020	<0.020
Arochlor-1254	2.9	<0.020	<0.020	<0.020	<0.020	<0.020
Arochlor-1260	2.9	<0.020	<0.020	<0.020	<0.020	<0.020
Total Petroleum Hydrocarbons (TPH)						
TPH as Transformer Oil	200*	72.2	<5	11.7	<5	18.5

- Notes:
- (1) See Figure 2 for Sample Locations
  - (2) US EPA Region III Risk Based Concentrations are presented for industrial sites.
  - (3) PCB analyses were performed via US EPA Method 8080.
  - (4) TPH analyses were performed via US EPA Method 8100M. Reference standard was transformer oil supplied by Green Mountain Power Corp.
  - (5) The State of Vermont has often cited a TPH value of 200 ppm for residential sites.

## APPENDIX A



# TWIN STATE ENVIRONMENTAL CORPORATION

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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-1	WELL DEPTH:	8.0 feet	BORING DEPTH:	8.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	No water present		
PROJECT NO:	98-078	SCREEN DIA:	1-inch	DEPTH:	3.0-8.0 ft bgs.
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	0.010-Slot Schedule 40 PVC		
TSEC REP:	Jon Berntsen	RISER TYPE:	Schedule 40 PVC		
DRILLING CO:	TSEC	RISER DIA.:	1-inch	DEPTH:	2.0 ft ags to 3.0 ft bgs
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	Stickup		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	Gripper Plug		
REMARKS:	Boring was finished with 1" PVC Groundwater Monitoring Well.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0		0-2	<0.1	1.5 ft recovery	0.0-0.25: GRAVEL, medium to coarse, angular. 0.25-0.5: Medium and coarse SAND. Lt. brown. 0.5-1.5: Black fill material.	CEMENT GROUT
1						
2		2-4	<0.1	1.0 ft recovery	2.0-3.0: Fine to medium SAND with a trace of silt. Brown, dry.	NATIVE BACKFILL
3						
4		4-8	<0.1	2.0 ft recovery	4.0-4.25: Silty fine SAND. Light gray, dry.	BENTONITE SEAL
5					4.25-5.0: Silty fine to medium SAND with trace of gravel. Brown, dry.	SAND PACK
6					5.0-6.0: Silty fine to medium SAND with trace of gravel. Brown, saturated lens from 5.0- 5.2 ft. Dry below.	
7					Refusal at 8.0 ft bgs. End of Sampling = 8.0 feet End of Boring = 8.0 feet	WELL SCREEN
8						RISER PIPE
9						HS HEAD SPACE
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%	
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%	
4-10	LOOSE	2-4	SOFT	SOME	20-35%	
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%	
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			



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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-2	WELL DEPTH:	NA	BORING DEPTH:	6.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.0 ft recovery	0.0-0.5: Medium to coarse angular GRAVEL fill. Gray.	CEMENT GROUT
1	O				0.5-0.75: Fine to medium SAND fill. Tan, dry.	
2					0.75-2.0: Black fill material.	NATIVE BACKFILL
3	W					
4	E	4-8	<0.1	2.0 ft recovery	4.0-4.5: Fine to medium SAND. Tan, dry.	BENTONITE SEAL
5	L				4.5-5.0: Fine to medium SAND with trace of organic material. Brown.	SAND PACK
6	L				5.0-6.0: Fine to medium silty SAND with gravel. Red/brown, damp.	
7					Refusal at 6.0 ft bgs.	WELL SCREEN
8	I				End of Sampling = 6.0 feet	RISER PIPE
9	N				End of Boring = 6.0 feet	
10	S					HS HEAD SPACE
11	T					WATER LEVEL (APPROXIMATE)
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE		
0-4	V.LOOSE	<2	V.SOFT	LITTLE		
4-10	LOOSE	2-4	SOFT	SOME		
10-30	M.DENSE	4-8	M.STIFF	AND		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			



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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-3	WELL DEPTH:	NA	BORING DEPTH:	5.5 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.0 ft recovery	0.0-0.3: Medium to coarse angular GRAVEL. Gray, dry.	CEMENT GROUT
1	O				0.3-0.6: Fine to medium SAND fill. Tan, dry.	
2					0.6-1.0: Black coarse fill material (looks like foundry slag).	NATIVE BACKFILL
3	W				1.0-2.0: Fine to coarse SNAD. Tan, dry.	
4	E	4-8	<0.1	1.5 ft recovery	4.0-5.5: Fine silty SAND. Red/brown, damp.	BENTONITE SEAL
5	L					SAND PACK
6	L					
7					Refusal at 5.5 ft bgs.	
8	I				End of Sampling = 5.5 feet	WELL SCREEN
9	N				End of Boring = 5.5 feet	
10	S					RISER PIPE
11	T					
12	A					HS HEAD SPACE
13	L					
14	L					WATER LEVEL (APPROXIMATE)
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%	
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%	
4-10	LOOSE	2-4	SOFT	SOME	20-35%	
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%	
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			

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**MONITORING WELL/SOIL BORING LOG**

WELL/BORING NO:	B-4	WELL DEPTH:	NA	BORING DEPTH:	4.5 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.0 ft recovery	0.0-1.0: Medium to coarse GRAVEL. Gray, dry.	CEMENT GROUT
1	O				1.0-1.2: Black fill material.	
2					1.2-2.0: Silty medium SAND. Tan, dry.	NATIVE BACKFILL
3	W					
4	E	4-8	<0.1	0.5 ft recovery	4.0-5.5: Silty medium SAND.	BENTONITE SEAL
5	L				Refusal at 4.5 ft bgs.	
6	L				End of Sampling = 4.5 feet	SAND PACK
7					End of Boring = 4.5 feet	
8	I					WELL SCREEN
9	N					
10	S					RISER PIPE
11	T					
12	A					HEAD SPACE
13	L					
14	L					
15	E					WATER LEVEL (APPROXIMATE)
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
<b>GRANULAR SOILS</b>		<b>COHESIVE SOILS</b>		<b>PROPORTIONS USED</b>	<b>NOTES:</b> 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE		
0-4	V.LOOSE	<2	V.SOFT	LITTLE		
4-10	LOOSE	2-4	SOFT	SOME		
10-30	M.DENSE	4-8	M.STIFF	AND		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			





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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-5	WELL DEPTH:	NA	BORING DEPTH:	4.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	3.0 ft recovery	0.0-0.5: Medium to coarse GRAVEL. Gray, dry.	CEMENT GROUT
1	O				0.5-1.0: Fine to medium SAND. Tan, dry.	
2					1.0-2.0: Black fill material.	NATIVE BACKFILL
3	W				2.0-3.0: Fine silty SAND. Red/brown, damp.	
4	E				Dolomitic bedrock in core tip.	BENTONITE SEAL
5	L				Refusal at 4.0 ft bgs.	
6	L				End of Sampling = 4.0 feet	SAND PACK
7					End of Boring = 4.0 feet	
8	I					WELL SCREEN
9	N					
10	S					RISER PIPE
11	T					
12	A					HS HEAD SPACE
13	L					
14	L					WATER LEVEL (APPROXIMATE)
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE		
0-4	V.LOOSE	<2	V.SOFT	LITTLE		
4-10	LOOSE	2-4	SOFT	SOME		
10-30	M.DENSE	4-8	M.STIFF	AND		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			

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**MONITORING WELL/SOIL BORING LOG**

WELL/BORING NO:	B-6	WELL DEPTH:	NA	BORING DEPTH:	1.0 foot
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	1.0 ft recovery	0.0-0.5: Medium to coarse GRAVEL. Gray, dry. 0.5-1.0: Fine to medium SAND. Tan, dry.	CEMENT GROUT
1	O					NATIVE BACKFILL
2						BENTONITE SEAL
3	W				Refusal at 1.0 ft bgs.	SAND PACK
4	E				End of Sampling = 1.0 foot	WELL SCREEN
5	L				End of Boring = 1.0 foot	RISER PIPE
6	L					HEAD SPACE
7						WATER LEVEL (APPROXIMATE)
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%	
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%	
4-10	LOOSE	2-4	SOFT	SOME	20-35%	
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%	
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			

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**MONITORING WELL/SOIL BORING LOG**

WELL/BORING NO:	B-6B	WELL DEPTH:	NA	BORING DEPTH:	2.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	1.0 ft recovery	0.0-0.5: Medium to coarse GRAVEL. Gray, dry. 0.5-1.0: Fine to medium SAND. Tan, dry.	CEMENT GROUT
1	O					NATIVE BACKFILL
2						BBNTONITE SEAL
3	W				Refusal at 2.0 ft bgs.	SAND PACK
4	E				End of Sampling = 2.0 feet	WELL SCREEN
5	L				End of Boring = 2.0 feet	RISER PIPE
6						HS HEAD SPACE
7						WATER LEVEL (APPROXIMATE)
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
<b>GRANULAR SOILS</b>		<b>COHESIVE SOILS</b>		<b>PROPORTIONS USED</b>		<b>NOTES:</b> 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%	
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%	
4-10	LOOSE	2-4	SOFT	SOME	20-35%	
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%	
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			



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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-7	WELL DEPTH:	NA	BORING DEPTH:	3.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	3.0 ft recovery	0.0-0.5: Medium to coarse GRAVEL. Gray, dry.	CEMENT GROUT
1	O				0.5-1.0: Very fine to medium SAND. Gray, damp.	NATIVE BACKFILL
2					1.0-3.0: Silty SAND with trace of gravel. Wet from 2.2 to 2.4 ft.	BENTONITE SEAL
3	W				Refusal at 3.0 ft bgs.	SAND PACK
4	E				End of Sampling = 3.0 feet	WELL SCREEN
5	L				End of Boring = 3.0 feet	RISER PIPE
6	L					HS HEAD SPACE
7						WATER LEVEL (APPROXIMATE)
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%	
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%	
4-10	LOOSE	2-4	SOFT	SOME	20-35%	
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%	
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			



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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-8	WELL DEPTH:	NA	BORING DEPTH:	3.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.5 ft recovery	0.0-0.5: Black fill material.	CEMENT GROUT
1	O				0.5-1.5: Very fine to medium SAND. Gray, damp.	NATIVE BACKFILL
2					1.5-2.5: Silty SAND with trace of gravel.	BENTONITE SEAL
3	W				Refusal at 3.0 ft bgs.	SAND PACK
4	E				End of Sampling = 3.0 feet	WELL SCREEN
5	L				End of Boring = 3.0 feet	RISER PIPE
6	L					HS HEAD SPACE
7						WATER LEVEL (APPROXIMATE)
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE		
0-4	V.LOOSE	<2	V.SOFT	LITTLE		
4-10	LOOSE	2-4	SOFT	SOME		
10-30	M.DENSE	4-8	M.STIFF	AND		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			



# TWIN STATE ENVIRONMENTAL CORPORATION

Page 1 of 1

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477  
(802) 434-3350 FAX: (802) 434-4478

## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-9	WELL DEPTH:	NA	BORING DEPTH:	2.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	1.0 ft recovery	0.0-0.5: GRAVEL parking lot base.	CEMENT GROUT
1	O				0.5-1.0: Very fine to medium SAND. Gray, damp.	NATIVE BACKFILL
2						BENTONITE SEAL
3	W				Refusal at 3.0 ft bgs.	SAND PACK
4	E				End of Sampling = 2.0 feet	WELL SCREEN
5	L				End of Boring = 2.0 feet	RISER PIPE
6	L					HS HEAD SPACE
7						WATER LEVEL (APPROXIMATE)
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE		
0-4	V.LOOSE	<2	V.SOFT	LITTLE		
4-10	LOOSE	2-4	SOFT	SOME		
10-30	M.DENSE	4-8	M.STIFF	AND		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			



# TWIN STATE ENVIRONMENTAL CORPORATION

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## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-10	WELL DEPTH:	NA	BORING DEPTH:	6.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.5 ft recovery	0.0-1.0: SAND and SILT topsoil with organic material. Brown..	CEMENT GROUT
1	O				1.0-2.0: Gray CLAY. Dense.	
2					2.0-2.5: Medium, coarse, and very coarse SAND and GRAVEL.	NATIVE BACKFILL
3	W					
4	E	4-8	<0.1	2.0 ft recovery	4.0-6.0: Gray CLAY. Tight, dense, dry.	BENTONITE SEAL
5	L					SAND PACK
6	L				Refusal at 6.0 ft bgs.	
7					End of Sampling = 6.0 feet	WELL SCREEN
8	I				End of Boring = 6.0 feet	
9	N					RISER PIPE
10	S					
11	T					
12	A					HEAD SPACE
13	L					
14	L					WATER LEVEL (APPROXIMATE)
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE 0-10%		
0-4	V.LOOSE	<2	V.SOFT	LITTLE 10-20%		
4-10	LOOSE	2-4	SOFT	SOME 20-35%		
10-30	M.DENSE	4-8	M.STIFF	AND 35-50%		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STUFF			
		>30	HARD			



# TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477  
(802) 434-3350 FAX: (802) 434-4478

Page 1 of 1

## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-11	WELL DEPTH:	NA	BORING DEPTH:	2.0 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.0 ft recovery	0.0-0.25: Silty SAND topsoil and organics.	CEMENT GROUT
1	O				0.25-2.0: Very fine to medium silty SAND. Gray, damp.	NATIVE BACKFILL
2						
3	W				Refusal at 2.0 ft bgs.	BENTONITE SEAL
4	E				End of Sampling = 2.0 feet	SAND PACK
5	L				End of Boring = 2.0 feet	
6	L					WELL SCREEN
7						
8	I					RISER PIPE
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED		NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE	0-10%	
0-4	V.LOOSE	<2	V.SOFT	LITTLE	10-20%	
4-10	LOOSE	2-4	SOFT	SOME	20-35%	
10-30	M.DENSE	4-8	M.STIFF	AND	35-50%	
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			





# TWIN STATE ENVIRONMENTAL CORPORATION

65 Huntington Road, P.O. Box 719 Richmond, Vermont 05477  
(802) 434-3350 FAX: (802) 434-4478

Page 1 of 1

## MONITORING WELL/SOIL BORING LOG

WELL/BORING NO:	B-12	WELL DEPTH:	NA	BORING DEPTH:	2.5 feet
PROJECT NAME:	Chace Mill #29	DEPTH TO WATER:	NA		
PROJECT NO:	98-078	SCREEN DIA:	NA	DEPTH:	NA
INSTALL DATE:	October 6, 1998	SCREEN TYPE/SIZE:	NA		
TSEC REP:	Jon Berntsen	RISER TYPE:	NA		
DRILLING CO:	TSEC	RISER DIA.:	NA	DEPTH:	NA
DRILLING METHOD:	Geoprobe® Tools	GUARD TYPE:	NA		
SAMPLING METHOD:	Macrocore Sampler	RISER CAP:	NA		
REMARKS:	Borings were backfilled with bentonite, drill cuttings, and sand.				

DEPTH IN FEET	WELL PROFILE	SAMPLE DEPTH (FT)	PID (PPMV)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
0	N	0-4	<0.1	2.0 ft recovery	0.0-0.7: Silty SAND topsoil and organics. 0.7-2.5: Very fine, medium, and coarse silty SAND. Gray, damp. 2.5-: Bedrock cobble in cutting shoe.	CEMENT GROUT
1	O					NATIVE BACKFILL
2						BENTONITE SEAL
3	W					SAND PACK
4	E					WELL SCREEN
5	L				Refusal at 2.5 ft bgs. End of Sampling = 2.5 feet End of Boring = 2.5 feet	RISER PIPE
6	L					HS HEAD SPACE
7						WATER LEVEL (APPROXIMATE)
8	I					
9	N					
10	S					
11	T					
12	A					
13	L					
14	L					
15	E					
16	D					
17						
18						
19						
20						
21						
22						
23						
24						
25						
GRANULAR SOILS		COHESIVE SOILS		PROPORTIONS USED	NOTES: 1. See Figure 2, SITE Plan, for boring locations 2. PID readings were obtained using a Thermo Environmental Instruments Model 580 B PID equipped with a 10.6eV lamp. Conventional headspace techniques were used.	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY	TRACE		
0-4	V.LOOSE	<2	V.SOFT	LITTLE		
4-10	LOOSE	2-4	SOFT	SOME		
10-30	M.DENSE	4-8	M.STIFF	AND		
30-50	DENSE	8-15	STIFF			
>50	V.DENSE	15-30	V.STIFF			
		>30	HARD			

**ATTACHMENT 1**



## State of Vermont

Department of Fish and Wildlife  
Department of Forests, Parks and Recreation  
Department of Environmental Conservation  
State Geologist  
RELAY SERVICE FOR THE HEARING IMPAIRED  
1-800-253-0191 TDD>Voice  
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES  
Department of Environmental Conservation  
Waste Management Division  
103 South Main Street/West Office  
Waterbury, Vermont 05671-0404  
(802) 241-3888  
FAX (802) 241-3296

June 26, 1998

Ms. Nancy A. Huelsberg  
Green Mountain Power Company  
P.O. Box 850  
South Burlington, Vermont 05402-0850

RE: Request for Additional Investigation  
Chase Mill Substation (#29), Burlington, Vermont  
SMS Site 97-2325

Dear Ms. Huelsberg:

Pursuant to our site meeting of June 9, 1998 SMS is requesting further investigation at the above referenced site. During our meeting we discussed the need for additional groundwater quality information downgradient of the release. Also discussed was the fact that the transformer at the site contained Mineral Oil Dielectric Fluid (MODF) with polychlorinated biphenyls (PCB) in concentrations of 5 and 9 ppm.

The following site investigation history is reconstructed from lab reports and diagrams submitted by GMPC in a letter dated November 10, 1997.

The release was discovered November 1993 (based on lab report dates) and was reported to the Sites Management Section (SMS) in a letter dated November 10, 1997. A portion of the consultants report (lab data, tables, and figures) was provided to SMS with text generated by your office. The data provided indicate soils within the fenced transformer area (sample id E-893-1 through 13) are contaminated with total BTEX ranging from non-detect to 666 parts per billion (ppb) and TPH ranging from 21 to 4,180 parts per million (ppm). All 13 soil samples contained detectable concentrations of TPH and/or BTEX compounds. No analyses were for PCB's were conducted on these samples.

Soils borings and monitoring wells were installed at or proximal to the perimeter of the fenced transformer yard. Boring B-1 appears to have been installed in December 1993 or January 1994. A soil sample was submitted for laboratory analysis of TPH and BTEX. The Chain of Custody for this sample has conflicting sample dates of what appears to be December 27, 1993 overwritten with the date January 17, 1994. The sample contained 169 ppm TPH.

On April 6 and 7, 1994 soils samples were obtained during the installation of monitoring wells MW-2 and MW-3. On April 8, 1998 soil samples were obtained from borings B-1, B-2, and B-3. These five soil samples did not contain detectable concentrations of PCB or TPH. Based on the lab sheets no samples were submitted for MW-1 yet the summary table indicates no BTEX compounds were detected for this location. SMS assumes that this B-1 boring is separate and distinct from the B-1 boring of December 1993. Is the first boring identified as B-1 actually the boring for monitoring well MW-1? The summary table indicates that no TPH was detected yet the B-1 sample with a 1993/1994 lab date contained 169 ppm.

On April 10, 1994 ground water samples were obtained from MW-1 through MW-3 and analyzed for BTEX and TPH. With the exception of 2.0 ppb xylene in MW-2, no other BTEX or TPH compounds were detected.

Ms. Nancy A. Huelsberg  
Green Mountain Power Company

Page 2

On May 17, 1994 five additional soil samples were collected and submitted for laboratory analysis BTEX. These samples, labeled B1A, B2A, B3A, MW-2A and MW-3A, contained no detectable concentrations of BTEX.

Based on a contour map provided by groundwater flows northwest at a gradient of approximately 6-7 percent. This would indicate that MW-1 and MW-2 were installed in an upgradient location to the release area and MW-3 was installed oblique to the release area. Bedrock outcrop is located approximately 30 feet south of the substation and all along the river which is less than 100 feet north of the substation.

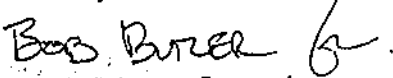
Based on this information and our site meeting SMS requests the following:

- ☐ Install at least one additional monitoring well downgradient of the release area. A soil sample from the well should be analyzed for TPH and BTEX. If TPH is detected, then the soil should be analyzed for PCB. Groundwater sample from that well should be analyzed for TPH and BTEX.
- ☐ If GMPC elects to leave the contaminated soils in-situ then the soils should be analyzed for PCB. If PCB's are detected, then a risk assessment should be conducted including recommendations for mitigation or controls of the soil.
- ☐ Conduct a sensitive receptor survey in accordance with *Site Investigation Guidance* dated August 1996;
- ☐ Provide an explanation as to why GMPC waited four years to report this release;
- ☐ Provide a history of the Clean Harbors Investigation that will lend some clarity to the sample history (eg. multiple B-1 borings, inconsistencies between CHES tables and lab sheets, and inconsistencies with Chain-of-Custody date for the B-1 sample (12/93 or 1/94).
- ☐ Provide all appropriate data on the PCB concentrations in the MODF from the site transformers;
- ☐ Submit these data and previous data in a report that is consistent with the requirements of *Site Investigation Guidance* dated August 1996. Specifically, SMS requests that this include the information stipulated in the section Site Investigation Report on pages 3 through 5 of the document.

Please have your consultant submit a preliminary work plan and cost estimate or a site investigation expressway notification form within fifteen days of your receipt of this letter, so it may be approved prior to the initiation of onsite work. Enclosed please find a list of consultants who perform this type of work as well as the brochure "*Selecting Your UST Cleanup Contractor*," which will help you in choosing an environmental consultant.

If you have any questions, please feel free to call me at (802) 241-3876.

Sincerely,



Chuck Schwer, Supervisor  
--Sites Management Section

CS/rgb  
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**ATTACHMENT 2**

# **HEALTH AND SAFETY PLAN**

**GMP CHACE MILL  
SUBSTATION #29  
MILL STREET  
BURLINGTON, VERMONT**



**TWIN STATE**

**ENVIRONMENTAL**

P.O. Box 719 -- Richmond, Vermont 05477 -- (802) 434-3350 [tsefs@together.net](mailto:tsefs@together.net)

## SITE SPECIFIC HEALTH AND SAFETY PLAN

Site Name: Green Mountain Power Corporation  
Chace Mill Substation #29  
TSEC Project #: 98-078  
SITE Location: Mill Street, Burlington, Vermont  
SITE Owner: GMP  
SITE Contact: Ms. Nancy Huelsberg (802) 660-5674  
TSEC Project Manager: Jon Berntsen (802) 434-3350

### 1.0 EMERGENCY PHONE NUMBERS:

AMBULANCE ..... 9-1-1  
POLICE..... 9-1-1  
HOSPITAL ..... 802-656-2434  
(Fletcher Allen Hospital)  
FIRE DEPT ..... 9-1-1  
POISON CONTROL ..... 802-658-3456  
Burlington Vermont Poison Center  
NATIONAL RESPONSE CENTER ..... 800-424-8802  
EPA (information line) ..... 800-424-9346  
CHEMTREC..... 800-424-9300

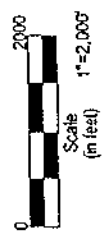
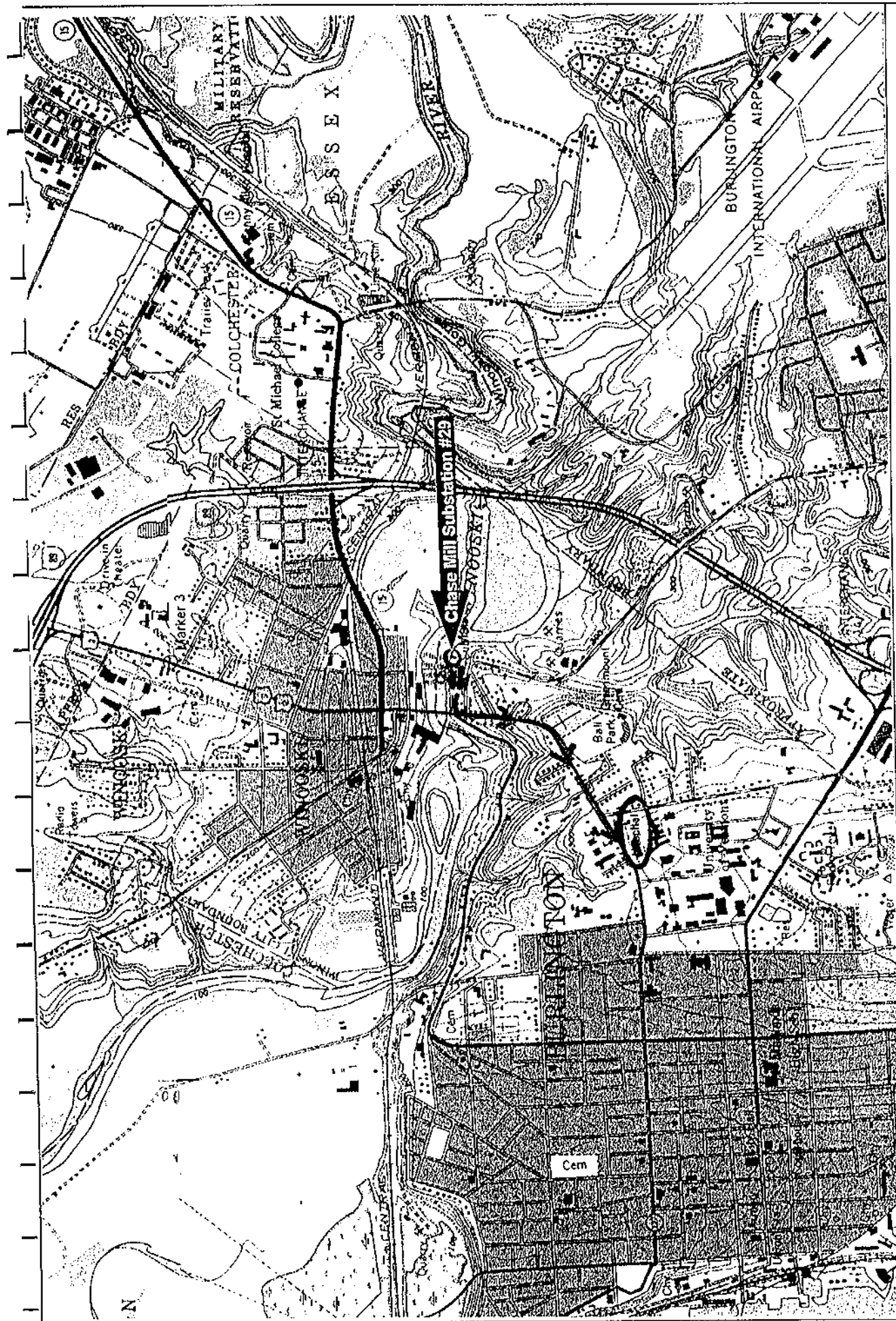
### *DIRECTIONS TO HOSPITAL*

#### FROM SITE:

Exit SITE and take a **LEFT** onto **ROUTE 127** towards Burlington. At 5-way intersection, **DO NOT TAKE RIVERSIDE DRIVE!** Stay left on Rt. 127. Hospital is ½ mile ahead on your left.

### 2.0 SITE DESCRIPTION AND HISTORY

The SITE is an active power transformer facility located along the Winooski River in Burlington, Vermont. There has been a documented release of oil to the ground surface, and levels of TPH exist that are in exceedance of acceptable criteria. GMP is concerned with the potential impact that past activities have had on the SITE.



Project No: 98-078  
 Designed By: jpb  
 Checked By:  
 Approved By:  
 Drawn By: jpb  
 Scale: as shown  
 Date: 07/18/98

TWIN STATE ENVIRONMENTAL CORP.  
 65 Harrington Rd.  
 P.O. Box 719  
 Richmond, Vermont  
 (802) 434-3350

FIGURE 1  
 SITE LOCATION MAP  
 Green Mountain Power Corp.  
 Chase Mill Substation #25  
 Burlington, Vermont

Source: USGS 7.5 Minute Topographic Series  
 Burlington and Colchester, Vermont Quadrangles



### 3.0 PROJECT ACTIVITIES

Activities which are expected to be conducted during this project are addressed in this HASP and summarized as follows:

- Geoprobe® investigation.
- Monitoring well installation and sampling.
- Surveying.

### 4.0 SITE HAZARDS

#### *HAZARDOUS MATERIALS KNOWN OR SUSPECTED TO BE PRESENT:*

- PCB's
- Transformer Oil

#### *SITE-SPECIFIC CONSIDERATIONS:*

- Workers entering the investigation area **MUST** follow rules and regulations as outlined by 29 CFR 1910 and 29 CFR 1926 for operations at hazardous sites.
- PCB's are known carcinogens that may be harmful to worker health. If any of the warning signs of exposure are evident in workers, the use of air purifying respirators and additional PPE will be mandatory.

#### *PHYSICAL HAZARDS:*

- Heavy machinery such as Geoprobe® and work vehicles.
- Winooski River
- **High Voltage** Power Lines overhead.

#### *CHEMICAL HAZARDS:*

- Potential contact with the aforementioned chemicals..

#### *NOISE HAZARDS:*

- Heavy machinery and electrical motors.

## 5.0 SITE PERSONNEL REQUIREMENTS

### *HEALTH AND SAFETY TRAINING:*

All personnel to perform work on SITE or enter the remedial zone will be required to have OSHA certification conforming to 29CFR 1910.120.

## 6.0 SITE HEALTH AND SAFETY PROCEDURES

### *PROCEDURES FOR SITE WORK:*

This SSP defines the requirements and designated protocols to be followed at the SITE during investigation activities.

This SSP must be reviewed and signed by all personnel prior to entering the remedial or contaminant reduction zones on SITE.

In the event that any worker, or visitor does not adhere to the provisions of the SSP he/she will be requested to leave the work area.

### *ACTION LEVELS:*

Action levels are those concentrations at which an upgrade in personal protective equipment (PPE) is required. TSEC will attempt to minimize exposure through the use of engineering controls at the SITE. Site controls include the use of the Geoprobe<sup>®</sup>, and the minimization of SITE disturbance. The decision to upgrade shall be based on conditions at the work-SITE. Conditions that may be cause for upgrade may include, but are not limited to airborne particulates, odor, slight symptoms of contact or exposure, and PID readings (background) of 5 ppmv.

Initial activities will be performed in Level D work clothes (with the use of TYVEK suits if necessary) with upgrade capabilities to Level C (respirator) if the HSO deems it to be necessary.

### *PERSONAL PROTECTIVE EQUIPMENT:*

General work clothes, steel toe boots, and eye protection. If necessary, air purifying respirators, latex overboots, TYVEK suits, and nitrile gloves will be used.

### *SITE CONTROL:*

Control of the work SITE will be maintained with construction/CAUTION tape, traffic cones and/or other physical barriers. No personnel, other than those directly involved with the investigation should be near the drilling equipment at any time.

*EQUIPMENT DECONTAMINATION:*

Decontamination of equipment will be performed on SITE and the effluent water will be allowed to gather on plastic sheeting. The effluent will be allowed to evaporate, and the sheeting will be placed into a 55-gallon drum for subsequent disposal.

*PERSONAL DECONTAMINATION:*

Decontamination measures for this project may include the use of a boot and glove wash with a non-phosphate detergent followed by a boot and glove rinse. All wash water and solid wastes generated throughout the implementation of this project will be disposed of properly.

Specifically, wastes from this project will be disposed of as follows:

Solid wastes such as disposable PPE will be placed in an on-site receptacle (i.e. drum) for ultimate disposal as a regulated solid waste. Liquid waste (i.e.- wash water) will be allowed to evaporate while personnel are on-SITE. Prior to leaving the SITE, liquid wastes will be placed into drums.

*EMERGENCY EQUIPMENT:*

Fire extinguisher, first aid kit, water and eye wash station.

*FIRST AID:*

Ingestion - Call Poison Control - Follow instructions.

Inhalation - Remove person from contaminated environment. Seek medical attention.

Skin Contact - Brush off dry material, remove contaminated clothing. Wash skin with soap and water. Seek medical attention if necessary.

Eye Contact - Flush eyes with water for at least 15 minutes. Seek medical attention.

**7.0 ON-SITE ORGANIZATION AND COORDINATION**

The following personnel are designated to carry out the stated job functions on site.

TEAM LEADER: Jon Berntsen

TEAM MEMBERS: Rod Lindsay,

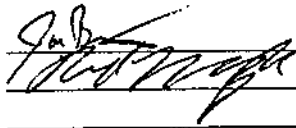
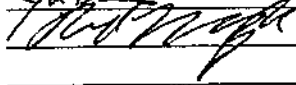
HEALTH AND SAFETY PLAN

PREPARED BY: Jon Berntsen

HEALTH AND SAFETY PLAN

APPROVED BY: John R. Diego

**8.0 ON-SITE PERSONNEL**

<u>Name</u>	<u>Company</u>	<u>Date</u>
	TSEL	10/6/98
	TSEL	10-6-98

jpb:\project\98-078\GMP HASP.doc

## HEALTH AND SAFETY MEETING ATTENDANCE LOG

Date:	Time:	Project No.:
Customer:		
Type of Work:		

### SAFETY TOPICS PRESENTED

(1) Level of Protection:

(2) Protective Clothing/Equipment:

(3) Chemical Hazards:

(4) Physical Hazards:

### ATTENDEES (Names Printed)


Meeting Conducted By:

\_\_\_\_\_  
(Name Printed)

\_\_\_\_\_  
(Signature)

SUPERVISOR:

MANAGER:

# ACCIDENT REPORT FORM

TO:		FROM:	
		TELEPHONE (Include Area Code)	
NAME OF INJURED OR ILL EMPLOYEE:			
DATE OF ACCIDENT	TIME OF ACCIDENT	EXACT LOCATION OF ACCIDENT	
NARRATIVE DESCRIPTION OF ACCIDENT: (Include names of individuals present)			
NATURE OF ILLNESS OR INJURY AND PART OF BODY INVOLVED:			
PROBABLE DISABILITY (Check One)			
FATAL <input type="checkbox"/>	LOST WORK WITH ____ DAYS AWAY FROM WORK <input type="checkbox"/>	LOST WORK DAY WITH ____ DAYS OF RESTRICTED ACTIVITY <input type="checkbox"/>	NO LOST WORK DAY <input type="checkbox"/>
			FIRST AID ONLY <input type="checkbox"/>
CORRECTIVE ACTION TAKEN:			
CORRECTIVE ACTION WHICH REMAINS TO BE TAKEN (by whom and by when):			
NAME OF INDIVIDUAL COMPLETING FORM		SIGNATURE	DATE
NAME OF SUPERVISOR			
SIGNATURE		DATE	

**ATTACHMENT 3**



**ENDYNE, INC.**

OCT 28 1998

**Laboratory Services**

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

**REPORT OF LABORATORY ANALYSIS**

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
DATE REPORTED: October 23, 1998  
DATE SAMPLED: October 6, 1998

PROJECT CODE: TSEC1008  
REF. #: 128,364 - 128,368

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures





**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
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(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: October 23, 1998  
CLIENT: Twin State Environmental Corp.  
PROJECT: GMP #29  
PROJECT CODE: TSEC1008  
COLLECTED BY: Jon Berntsen  
DATE SAMPLED: October 6, 1998  
DATE RECEIVED: October 7, 1998

Reference #	Sample ID	Concentration (mg/kg) <sup>1</sup>
128,364	B-1 0-4'; 9:15	72.2
128,365	B-3 4-5'; 10:00	ND <sup>2</sup>
128,366	B-4 3-4'; 10:20	11.7
128,367	B-8 1-3'; 12:00	ND
128,368	B-12 0-2'; 14:15	18.5

Notes:

- 1 Value quantitated based on the response of Transformer Oil Standard provided by Client.  
Method detection limit is 5.0 mg/kg.
- 2 None Detected



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# CHAIN-OF-CUSTODY RECORD

126304-310 TSEC1008 29266

Project Name: GMP #29	Reporting Address: P.O. Box 719 RICHMOND, VT 05477	Billing Address: SAME AS
Site Location: BURLINGTON, VT	Company: TWIN STATE ENVIRONMENTAL CORP	Sampler Name: JON BERNTSEN
Endyne Project Number: TSEC1008	Contact Name/Phone #: JON BERNTSEN	Phone #: 802-434-3350

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
126364	B-1 0-4'	SOIL	✓		10/6/98 9:15	2	102 Glass	TPH 8100M, PCB 8080		ICE	
126365	B-3 4-5'		✓		10:00	2					
126366	B-4 3-4'		✓		10:20	2					
126367	B-8 1-3'		✓		12:00	2					
126368	B-12 0-2'		✓		14:15	2					
	TRANSFORMER OIL STANDARD	OIL	✓		1:15 PM	2	140ml/100	USE FOR 8100 M STANDARD			
	FOR EPA METHOD 8100M							TPH AS TRANSFORMER OIL			

Relinquished by: Signature	Received by: Signature	Date/Time 10/7/98
Relinquished by: Signature	Received by: Signature	Date/Time 10/7/98 9:20

New York State Project: Yes ☐ No ☒

Requested Analyses											
1	pH	6	TKN	11	Total Solids	15	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

OCT 29 1998



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REPORT OF LABORATORY ANALYSIS

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
DATE REPORTED: October 27, 1998  
DATE SAMPLED: October 6, 1998

PROJECT CODE: TSEC1009  
REF. #: 128,369-128,373

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures



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LABORATORY REPORT

EPA METHOD 8080 -- Arochlors (SOIL)

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
REPORT DATE: October 27, 1998  
DATE SAMPLED: October 6, 1998  
DATE RECEIVED: October 7, 1998  
DATE EXTRACTED: October 13, 1998

PROJECT CODE: TSEC1009  
ANALYSIS DATE: October 14, 1998  
STATION: B-1 0-4'  
REF.#: 128,369  
TIME SAMPLED: 9:15  
SAMPLER: Jon Berntsen

<u>Parameter</u>	<u>Detection Limit</u> ( $\mu\text{g/kg}$ )	<u>Concentration</u> <u>As Received</u> ( $\mu\text{g/kg}$ )
Arochlor-1016	20	ND <sup>1</sup>
Arochlor-1221	20	ND
Arochlor-1232	20	ND
Arochlor-1242	20	ND
Arochlor-1248	20	ND
Arochlor-1254	20	ND
Arochlor-1260	20	ND

Analytical Surrogate Recovery:

Dibutylchloroendate: 76.%

PERCENT SOLIDS: 77.%

NOTES:

1 None Detected



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LABORATORY REPORT

EPA METHOD 8080 -- Arochlors (SOIL)

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
REPORT DATE: October 27, 1998  
DATE SAMPLED: October 6, 1998  
DATE RECEIVED: October 7, 1998  
DATE EXTRACTED: October 13, 1998

PROJECT CODE: TSEC1009  
ANALYSIS DATE: October 14, 1998  
STATION: B-3 4-5'  
REF.#: 128,370  
TIME SAMPLED: 10:00  
SAMPLER: Jon Berntsen

<u>Parameter</u>	<u>Detection Limit</u> ( $\mu\text{g}/\text{kg}$ )	<u>Concentration</u> <u>As Received</u> ( $\mu\text{g}/\text{kg}$ )
Arochlor-1016	20	ND <sup>1</sup>
Arochlor-1221	20	ND
Arochlor-1232	20	ND
Arochlor-1242	20	ND
Arochlor-1248	20	ND
Arochlor-1254	20	ND
Arochlor-1260	20	ND

Analytical Surrogate Recovery:

Dibutylchloroendate: 43.%

PERCENT SOLIDS: 78.%

NOTES:

1 None Detected



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LABORATORY REPORT

EPA METHOD 8080 -- Arochlors (SOIL)

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
REPORT DATE: October 27, 1998  
DATE SAMPLED: October 6, 1998  
DATE RECEIVED: October 7, 1998  
DATE EXTRACTED: October 13, 1998

PROJECT CODE: TSEC1009  
ANALYSIS DATE: October 14, 1998  
STATION: B-4 3-4'  
REF.#: 128,371  
TIME SAMPLED: 10:20  
SAMPLER: Jon Berntsen

<u>Parameter</u>	<u>Detection Limit</u> ( $\mu\text{g/kg}$ )	<u>Concentration</u> <u>As Received</u> ( $\mu\text{g/kg}$ )
Arochlor-1016	20	ND <sup>1</sup>
Arochlor-1221	20	ND
Arochlor-1232	20	ND
Arochlor-1242	20	ND
Arochlor-1248	20	ND
Arochlor-1254	20	ND
Arochlor-1260	20	ND

Analytical Surrogate Recovery:

Dibutylchloroendate: 50.0%

PERCENT SOLIDS: 80.0%

NOTES:

1 None Detected



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LABORATORY REPORT

EPA METHOD 8080 -- Arochlors (SOIL)

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
REPORT DATE: October 27, 1998  
DATE SAMPLED: October 6, 1998  
DATE RECEIVED: October 7, 1998  
DATE EXTRACTED: October 13, 1998

PROJECT CODE: TSEC1009  
ANALYSIS DATE: October 14, 1998  
STATION: B-8 1-3'  
REF.#: 128,372  
TIME SAMPLED: 12:00  
SAMPLER: Jon Berntsen

<u>Parameter</u>	<u>Detection Limit</u> ( $\mu\text{g/kg}$ )	<u>Concentration</u> <u>As Received</u> ( $\mu\text{g/kg}$ )
Arochlor-1016	20	ND <sup>1</sup>
Arochlor-1221	20	ND
Arochlor-1232	20	ND
Arochlor-1242	20	ND
Arochlor-1248	20	ND
Arochlor-1254	20	ND
Arochlor-1260	20	ND

Analytical Surrogate Recovery:

Dibutylchloroendate: 52.%

PERCENT SOLIDS: 77.%

NOTES:

1 None Detected



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LABORATORY REPORT

EPA METHOD 8080 -- Aroclors (SOIL)

CLIENT: Twin State Environmental Corp.  
PROJECT NAME: GMP #29  
REPORT DATE: October 27, 1998  
DATE SAMPLED: October 6, 1998  
DATE RECEIVED: October 7, 1998  
DATE EXTRACTED: October 13, 1998

PROJECT CODE: TSEC1009  
ANALYSIS DATE: October 14, 1998  
STATION: B-12 0-2'  
REF.#: 128,373  
TIME SAMPLED: 14:15  
SAMPLER: Jon Berntsen

<u>Parameter</u>	<u>Detection Limit</u> <u>(<math>\mu\text{g/kg}</math>)</u>	<u>Concentration</u> <u>As Received (<math>\mu\text{g/kg}</math>)</u>
Arochlor-1016	20	ND <sup>1</sup>
Arochlor-1221	20	ND
Arochlor-1232	20	ND
Arochlor-1242	20	ND
Arochlor-1248	20	ND
Arochlor-1254	20	ND
Arochlor-1260	20	ND

Analytical Surrogate Recovery:

Dibutylchloroendate: 24.%<sup>2</sup>

PERCENT SOLIDS: 76.%

NOTES:

- 1 None Detected
- 2 Low Surrogate attributed to rigorous sample clean-up procedure.



## 29266

[illegible]

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature	Date/Time 10/7/98
Relinquished by: Signature	Received by: Signature <i>Claire M. Machino</i>	Date/Time 10/7/98 9:20

New York State Project: Yes No ☒

### Requested Analyses

Requested Analyses											
1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8050 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

**ATTACHMENT 4**

### Site Management Activity Completed (SMAC) Checklist

Site Number: 972325

Site Name: GMP CHACE MILL SUBSTATION # 29

Criteria	Yes	No	N/A
1. The source(s), nature and extent has been adequately defined.	X		
2. Source(s) has been removed, remediated or adequately contained.	X		
3. Levels of contaminants in soil and groundwater shall be stable, falling, or non-detectable.	X		
4. a) Groundwater enforcement standards are met on entire property...			X
b) ...are met at compliance point. Identify compliance point: _____			X
5. Soil guideline levels are met...	X		
...if not, engineering or institutional controls are in place.			X
6. No unacceptable threat to human health or the environment exists onsite.	X		
7. Site meets RCRA requirements.	X		
8. Site meets CERCLA requirements.	X		
Comments:			

Signature: \_\_\_\_\_

Date: \_\_\_\_\_